

# TRAITE DE COOPERATION EN MATIERE DE BREVETS

# PCT

## RAPPORT DE RECHERCHE INTERNATIONALE

(article 18 et règles 43 et 44 du PCT)

Référence du dossier du déposant ou du mandataire <b>PCT142</b>	<b>POUR SUITE A DONNER</b> voir la notification de transmission du rapport de recherche internationale (formulaire PCT/ISA/220) et, le cas échéant, le point 5 ci-après	
Demande internationale n° <b>PCT/FR 99/ 02947</b>	Date du dépôt international (jour/mois/année) <b>29/11/1999</b>	(Date de priorité (la plus ancienne) (jour/mois/année) <b>01/12/1998</b>
Déposant  <b>ARJO WIGGINS S.A. et al.</b>		

Le présent rapport de recherche internationale, établi par l'administration chargée de la recherche internationale, est transmis au déposant conformément à l'article 18. Une copie en est transmise au Bureau international.

Ce rapport de recherche internationale comprend 02 feuilles.

☒ Il est aussi accompagné d'une copie de chaque document relatif à l'état de la technique qui y est cité.

### 1. Base du rapport

- a. En ce qui concerne la langue, la recherche internationale a été effectuée sur la base de la demande internationale dans la langue dans laquelle elle a été déposée, sauf indication contraire donnée sous le même point.
- ☐ la recherche internationale a été effectuée sur la base d'une traduction de la demande internationale remise à l'administration.
- b. En ce qui concerne les séquences de nucléotides ou d'acides aminés divulguées dans la demande internationale (le cas échéant), la recherche internationale a été effectuée sur la base du listage des séquences :
- ☐ contenu dans la demande internationale, sous forme écrite.
- ☐ déposée avec la demande internationale, sous forme déchiffrable par ordinateur.
- ☐ remis ultérieurement à l'administration, sous forme écrite.
- ☐ remis ultérieurement à l'administration, sous forme déchiffrable par ordinateur.
- ☐ La déclaration, selon laquelle le listage des séquences présenté par écrit et fourni ultérieurement ne vas pas au-delà de la divulgation faite dans la demande telle que déposée, a été fournie.
- ☐ La déclaration, selon laquelle les informations enregistrées sous forme déchiffrable par ordinateur sont identiques à celles du listage des séquences présenté par écrit, a été fournie.

2. ☐ Il a été estimé que certaines revendications ne pouvaient pas faire l'objet d'une recherche (voir le cadre I).

3. ☐ Il y a absence d'unité de l'invention (voir le cadre II).

### 4. En ce qui concerne le titre,

- ☒ le texte est approuvé tel qu'il a été remis par le déposant.
- ☐ Le texte a été établi par l'administration et a la teneur suivante:

### 5. En ce qui concerne l'abrégé,

- ☒ le texte est approuvé tel qu'il a été remis par le déposant
- ☐ le texte (reproduit dans le cadre III) a été établi par l'administration conformément à la règle 38.2b). Le déposant peut présenter des observations à l'administration dans un délai d'un mois à compter de la date d'expédition du présent rapport de recherche internationale.

### 6. La figure des dessins à publier avec l'abrégé est la Figure n°

- ☐ suggérée par le déposant.
- ☐ parce que le déposant n'a pas suggéré de figure.
- ☐ parce que cette figure caractérise mieux l'invention.
- ☐ Aucune des figures n'est à publier.

# RAPPORT DE RECHERCHE INTERNATIONALE

Demande internationale No

P 99/02947

## A. CLASSEMENT DE L'OBJET DE LA DEMANDE

CIB 7 D21H25/08 D21H27/02 D21H21/40

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

## B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE

Documentation minimale consultée (système de classification suivi des symboles de classement)

CIB 7 D21H

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si réalisable, termes de recherche utilisés)

## C. DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie *	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
X	WALENSKI, W.: "Watermarks and Those That Are Not" DRUCKSPIEGEL 52, NO. 3: 66-68 (MARCH 1997). 'GER.!', XP002109409 page 67, colonne 4 -page 68, colonne 1	1,2,4, 11,19,20
A	DE 297 14 004 U (BOCKES JOSEF ;BECKENLEHNER KARIN (DE); HELMSTREIT HERBERT (DE)) 6 novembre 1997 (1997-11-06) le document en entier	1,12,13, 15,16,19
A	US 4 824 486 A (LAFLER ROBERT E) 25 avril 1989 (1989-04-25) le document en entier	1-5,11
A	WO 97 17493 A (MO OCH DOMSJÖE AB ;PETERSON LARS AAKE (SE)) 15 mai 1997 (1997-05-15) cité dans la demande	

☐ Voir la suite du cadre C pour la fin de la liste des documents

☒ Les documents de familles de brevets sont indiqués en annexe

### \* Catégories spéciales de documents cités:

"A" document définissant l'état général de la technique, non considéré comme particulièrement pertinent

"E" document antérieur, mais publié à la date de dépôt international ou après cette date

"L" document pouvant jeter un doute sur une revendication de priorité ou cité pour déterminer la date de publication d'une autre citation ou pour une raison spéciale (telle qu'indiquée)

"O" document se référant à une divulgation orale, à un usage, à une exposition ou tous autres moyens

"P" document publié avant la date de dépôt international, mais postérieurement à la date de priorité revendiquée

"T" document ultérieur publié après la date de dépôt international ou la date de priorité et n'appartenant pas à l'état de la technique pertinent, mais cité pour comprendre le principe ou la théorie constituant la base de l'invention

"X" document particulièrement pertinent: l'invention revendiquée ne peut être considérée comme nouvelle ou comme impliquant une activité inventive par rapport au document considéré isolément

"Y" document particulièrement pertinent: l'invention revendiquée ne peut être considérée comme impliquant une activité inventive lorsque le document est associé à un ou plusieurs autres documents de même nature, cette combinaison étant évidente pour une personne du métier

"&" document qui fait partie de la même famille de brevets

Date à laquelle la recherche internationale a été effectivement achevée

9 mars 2000

Date d'expédition du présent rapport de recherche internationale

23/03/2000

Nom et adresse postale de l'administration chargée de la recherche internationale  
Office Européen des Brevets, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Fonctionnaire autorisé

Songy, O

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 99/02947

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 29714004	U	06-11-1997	DE 19832878 A	01-07-1999
US 4824486	A	25-04-1989	US 4919044 A	24-04-1990
WO 9717493	A	15-05-1997	SE 505397 C	18-08-1997
			AU 704901 B	06-05-1999
			AU 7591796 A	29-05-1997
			CA 2236860 A	15-05-1997
			EP 0870089 A	14-10-1998
			NO 982058 A	03-07-1998
			NZ 322217 A	23-12-1998
			SE 9503958 A	10-05-1997

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For recording Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum) PCT142

### Box No. I TITLE OF INVENTION

UNCOATED PAPER HAVING A PSUEDO-WATERMARK AND METHOD OF MANUFACTURING THE SAME

### Box No. II APPLICANT

☐ This person is also inventor

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ARJO WIGGINS S.A.  
117, Quai du President Roosevelt  
92130 Issy-Les-Moulineaux  
FRANCE

Telephone No.  
(33) 1 41 08 60 00

Facsimile No.  
(33) 1 41 08 62 89

Teleprinter No.

Applicant's registration No. with the Office

State (that is, country) of nationality:

FRANCE

State (that is, country) of residence:

FRANCE

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

### Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

GOGUELIN Michel  
Les Fougeres,  
72310 BESSE SUR BRAY  
FRANCE

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

Applicant's registration No. with the Office

State (that is, country) of nationality:

FRANCE

State (that is, country) of residence:

FRANCE

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

### Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

ARJO WIGGINS S.A.  
Claudine CARRE  
117, Quai du President Roosevelt  
92442 Issy-Les-Moulineaux Cedex  
FRANCE

Telephone No.  
(33) (0) 1 41 08 19 67

Facsimile No.  
(33) (0) 1 41 08 62 89

Teleprinter No.

Agent's registration No. with the Office

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

**Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)**

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ROSSET Henri  
66, Allee de Combe Chatte  
37830 LE PIN  
FRANCE

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

Applicant's registration No. with the Office

State (that is, country) of nationality:

FRANCE

State (that is, country) of residence:

FRANCE

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

Applicant's registration No. with the Office

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

Applicant's registration No. with the Office

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

Applicant's registration No. with the Office

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

**Box No. V DESIGNATION OF STATES**

Mark the applicable check-boxes below; at least one must be marked.

The following designations are hereby made under Rule 4.9(a): **(Double-click here if you want all the boxes below checked.)****Regional Patent**

- ☒ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, CH & LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)*.....

**National Patent** *(if other kind of protection or treatment desired, specify on dotted line):*

- |   |  |  |
|---|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates               | <input checked="" type="checkbox"/> GE Georgia .....             | <input checked="" type="checkbox"/> MW Malawi .....                |
| <input type="checkbox"/> AG Antigua and Barbuda                           | <input checked="" type="checkbox"/> GH Ghana .....               | <input checked="" type="checkbox"/> MX Mexico .....                |
| <input checked="" type="checkbox"/> AL Albania .....                      | <input checked="" type="checkbox"/> GM Gambia .....              | <input type="checkbox"/> MZ Mozambique .....                       |
| <input checked="" type="checkbox"/> AM Armenia .....                      | <input checked="" type="checkbox"/> HR Croatia .....             | <input checked="" type="checkbox"/> NO Norway .....                |
| <input checked="" type="checkbox"/> AT Austria .....                      | <input checked="" type="checkbox"/> HU Hungary .....             | <input checked="" type="checkbox"/> NZ New Zealand .....           |
| <input checked="" type="checkbox"/> AU Australia .....                    | <input checked="" type="checkbox"/> ID Indonesia .....           | <input checked="" type="checkbox"/> PL Poland .....                |
| <input checked="" type="checkbox"/> AZ Azerbaijan .....                   | <input checked="" type="checkbox"/> IL Israel .....              | <input checked="" type="checkbox"/> PT Portugal .....              |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina .....       | <input checked="" type="checkbox"/> IN India .....               | <input checked="" type="checkbox"/> RO Romania .....               |
|   | <input checked="" type="checkbox"/> IS Iceland .....             | <input checked="" type="checkbox"/> RU Russian Federation .....    |
| <input checked="" type="checkbox"/> BB Barbados .....                     | <input checked="" type="checkbox"/> JP Japan .....               |  |
| <input checked="" type="checkbox"/> BG Bulgaria .....                     | <input checked="" type="checkbox"/> KE Kenya .....               | <input checked="" type="checkbox"/> SD Sudan .....                 |
| <input checked="" type="checkbox"/> BR Brazil .....                       | <input checked="" type="checkbox"/> KG Kyrgyzstan .....          | <input checked="" type="checkbox"/> SE Sweden .....                |
| <input checked="" type="checkbox"/> BY Belarus .....                      | <input checked="" type="checkbox"/> KP Democratic People's ..... | <input checked="" type="checkbox"/> SG Singapore .....             |
| <input type="checkbox"/> BZ Belize .....                                  | Republic of Korea .....  | <input checked="" type="checkbox"/> SI Slovenia .....              |
| <input checked="" type="checkbox"/> CA Canada .....                       | <input checked="" type="checkbox"/> KR Republic of Korea .....   | <input checked="" type="checkbox"/> SK Slovakia .....              |
| <input checked="" type="checkbox"/> CH & LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> KZ Kazakhstan .....          | <input checked="" type="checkbox"/> SL Sierra Leone .....          |
| <input checked="" type="checkbox"/> CN China .....                        | <input checked="" type="checkbox"/> LC Saint Lucia .....         | <input checked="" type="checkbox"/> TJ Tajikistan .....            |
| <input type="checkbox"/> CO Colombia .....                                | <input checked="" type="checkbox"/> LK Sri Lanka .....           | <input checked="" type="checkbox"/> TM Turkmenistan .....          |
| <input type="checkbox"/> CR Costa Rica .....                              | <input checked="" type="checkbox"/> LR Liberia .....             | <input checked="" type="checkbox"/> TR Turkey .....                |
| <input checked="" type="checkbox"/> CU Cuba .....                         | <input checked="" type="checkbox"/> LS Lesotho .....             | <input checked="" type="checkbox"/> TT Trinidad and Tobago .....   |
| <input checked="" type="checkbox"/> CZ Czech Republic .....               | <input checked="" type="checkbox"/> LT Lithuania .....           |  |
| <input checked="" type="checkbox"/> DE Germany .....                      | <input checked="" type="checkbox"/> LU Luxembourg .....          | <input type="checkbox"/> TZ United Republic of Tanzania            |
| <input checked="" type="checkbox"/> DK Denmark .....                      | <input checked="" type="checkbox"/> LV Latvia .....              | <input checked="" type="checkbox"/> UA Ukraine .....               |
| <input type="checkbox"/> DM Dominica .....                                | <input checked="" type="checkbox"/> MA Morocco .....             | <input checked="" type="checkbox"/> UG Uganda .....                |
| <input checked="" type="checkbox"/> DZ Algeria .....                      | <input checked="" type="checkbox"/> MD Republic of Moldova ..... | <input checked="" type="checkbox"/> US United States of America .. |
| <input checked="" type="checkbox"/> EE Estonia .....                      |  |  |
| <input checked="" type="checkbox"/> ES Spain .....                        | <input checked="" type="checkbox"/> MG Madagascar .....          | <input checked="" type="checkbox"/> UZ Uzbekistan .....            |
| <input checked="" type="checkbox"/> FI Finland .....                      | <input checked="" type="checkbox"/> MK The former Yugoslav ..... | <input checked="" type="checkbox"/> VN Viet Nam .....              |
| <input checked="" type="checkbox"/> GB United Kingdom .....               | Republic of Macedonia .....                                      | <input checked="" type="checkbox"/> YU Yugoslavia .....            |
| <input checked="" type="checkbox"/> GD Grenada .....                      |  | <input checked="" type="checkbox"/> ZA South Africa .....          |
|   | <input checked="" type="checkbox"/> MN Mongolia .....            | <input checked="" type="checkbox"/> ZW Zimbabwe .....              |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet

<input type="checkbox"/> .....	<input type="checkbox"/> .....	<input type="checkbox"/> .....
<input type="checkbox"/> .....	<input type="checkbox"/> .....	<input type="checkbox"/> .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except the designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)*

**Box No. VI PRIORITY CLAIM**

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) 01.12.98	98 15183	FRANCE		
item (2)				
item (3)				
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items    ☒ item (1)    ☐ item (2)    ☐ item (3)    ☐ item (4)    ☐ item (5)    ☐ other, see Supplemental Box

\*Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)): .....

**Box No. VII INTERNATIONAL SEARCHING AUTHORITY**

**Choice of International Searching Authority (ISA)** (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / .....

**Request to use results of earlier search: reference to that search** (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)	Number	Country (or regional Office)
01.12.98	98 15183	FRANCE

**Box No. VIII DECLARATIONS**

The following **declarations** are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):

		Number of declarations
<input type="checkbox"/> Box No. VIII (i)	Declaration as to the identify of the inventor	:
<input type="checkbox"/> Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	:
<input type="checkbox"/> Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	:
<input type="checkbox"/> Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America)	:
<input type="checkbox"/> Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty:	:

**Box No. IX CHECK LIST; LANGUAGE OF FILING**

This international application contains:

(a) the following number of sheets in paper form:

request (including declaration sheets) : 4  
 description (excluding sequence listing part) : 12  
 claims : 3  
 abstract : 1  
 drawings : 0

**Sub-total number of sheets :**

sequence listing part of description (*actual number of sheets if filed in paper form, whether or not also filed in computer readable form; see (b) below*) : \_\_\_\_\_

**Total number of sheets : 20**

(b) sequence listing part of description filed in computer readable form

(i) ☐ only (under Section 801(a)(i))(ii) ☐ in addition to being filed in paper form (under Section 801(a)(ii))

**Type and number of carriers** (diskette, CD-ROM, CD-R or other) on which the sequence listing part is contained (*additional copies to be indicated under item 9(ii), in right column*):

.....

This international application is **accompanied by** the following item(s) (*mark the applicable check-boxes below and indicate in right column the number of each item*):

Number of items

1. ☐ fee calculation sheet :
2. ☐ original separate power of attorney :
3. ☐ original general power of attorney :
4. ☒ copy of general power of attorney; reference number, if any:..... :
5. ☐ statement explaining lack of signature :
6. ☐ priority document(s) identified in Box No. VI as item(s):..... :
7. ☐ translation of international application into (language):..... :
8. ☐ separate indications concerning deposited microorganism or other biological material :
9. ☐ sequence listing in computer readable form (indicate also type and number of carriers (diskette, CD-ROM, CD-R or other )) :  
 (i) ☐ copy submitted for the purposes of international search under Rule 13<sup>ter</sup> only (and not as part of the international application) :  
 (ii) ☐ (*only where check-box (b)(i) or (b)(ii) is marked in left column*) additional copies including, where applicable, the copy for the purposes of international search under Rule 13<sup>ter</sup> :  
 (iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing part mentioned in left column :  
 10. ☒ other (*specify*) French Search Report..... :

**Figure of the drawings** which should accompany the abstract:**Language of filing** of the international application:**Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

*Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).*

Claudine Carre  
 Engineer-Intellectual Property

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings:  <input type="checkbox"/> received:  <input type="checkbox"/> not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	
6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid	

For International Bureau use only

Date of receipt of the record copy  
 by the International Bureau:



# TRAITE DE COOPERATION EN MATIERE DE BREVETS

## PCT

REC'D 30 NOV 2000

WIPO PCT

### RAPPORT D'EXAMEN PRELIMINAIRE INTERNATIONAL

(article 36 et règle 70 du PCT)



Référence du dossier du déposant ou du mandataire PCT 142	<b>POUR SUITE A DONNER</b> voir la notification de transmission du rapport d'examen préliminaire international (formulaire PCT/IPEA/416)	
Demande internationale n° PCT/FR99/02947	Date du dépôt international (jour/mois/année) 29/11/1999	Date de priorité (jour/mois/année) 01/12/1998
Classification internationale des brevets (CIB) ou à la fois classification nationale et CIB D21H25/08		
Déposant ARJO WIGGINS S.A. et al.		

1. Le présent rapport d'examen préliminaire international, établi par l'administration chargée de l'examen préliminaire international, est transmis au déposant conformément à l'article 36.
2. Ce RAPPORT comprend 4 feuilles, y compris la présente feuille de couverture.  
  
☒ Il est accompagné d'ANNEXES, c'est-à-dire de feuilles de la description, des revendications ou des dessins qui ont été modifiées et qui servent de base au présent rapport ou de feuilles contenant des rectifications faites auprès de l'administration chargée de l'examen préliminaire international (voir la règle 70.16 et l'instruction 607 des Instructions administratives du PCT).

Ces annexes comprennent 3 feuilles.

3. Le présent rapport contient des indications relatives aux points suivants:

- I ☒ Base du rapport
- II ☐ Priorité
- III ☐ Absence de formulation d'opinion quant à la nouveauté, l'activité inventive et la possibilité d'application industrielle
- IV ☐ Absence d'unité de l'invention
- V ☒ Déclaration motivée selon l'article 35(2) quant à la nouveauté, l'activité inventive et la possibilité d'application industrielle; citations et explications à l'appui de cette déclaration
- VI ☐ Certains documents cités
- VII ☐ Irrégularités dans la demande internationale
- VIII ☐ Observations relatives à la demande internationale

Date de présentation de la demande d'examen préliminaire internationale  27/06/2000	Date d'achèvement du présent rapport  28.11.2000
Nom et adresse postale de l'administration chargée de l'examen préliminaire international:   Office européen des brevets D-80298 Munich Tél. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Fonctionnaire autorisé  Tiercet, M  N° de téléphone +49 89 2399 8977  

# RAPPORT D'EXAMEN PRÉLIMINAIRE INTERNATIONAL

Demande internationale n° PCT/FR99/02947

## I. Base du rapport

1. Ce rapport a été rédigé sur la base des éléments ci-après (*les feuilles de remplacement qui ont été remises à l'office récepteur en réponse à une invitation faite conformément à l'article 14 sont considérées dans le présent rapport comme "initialement déposées" et ne sont pas jointes en annexe au rapport puisqu'elles ne contiennent pas de modifications (règles 70.16 et 70.17).*) :

### Description, pages:

1-12                      version initiale

### Revendications, N°:

1-19                      reçue(s) avec télécopie du              15/11/2000

2. En ce qui concerne la **langue**, tous les éléments indiqués ci-dessus étaient à la disposition de l'administration ou lui ont été remis dans la langue dans laquelle la demande internationale a été déposée, sauf indication contraire donnée sous ce point.

Ces éléments étaient à la disposition de l'administration ou lui ont été remis dans la langue suivante: , qui est :

- ☐ la langue d'une traduction remise aux fins de la recherche internationale (selon la règle 23.1(b)).
- ☐ la langue de publication de la demande internationale (selon la règle 48.3(b)).
- ☐ la langue de la traduction remise aux fins de l'examen préliminaire internationale (selon la règle 55.2 ou 55.3).

3. En ce qui concerne les **séquences de nucléotides ou d'acide aminés** divulguées dans la demande internationale (le cas échéant), l'examen préliminaire internationale a été effectué sur la base du listage des séquences :

- ☐ contenu dans la demande internationale, sous forme écrite.
- ☐ déposé avec la demande internationale, sous forme déchiffrable par ordinateur.
- ☐ remis ultérieurement à l'administration, sous forme écrite.
- ☐ remis ultérieurement à l'administration, sous forme déchiffrable par ordinateur.
- ☐ La déclaration, selon laquelle le listage des séquences par écrit et fourni ultérieurement ne va pas au-delà de la divulgation faite dans la demande telle que déposée, a été fournie.
- ☐ La déclaration, selon laquelle les informations enregistrées sous déchiffrable par ordinateur sont identiques à celles du listage des séquences Présenté par écrit, a été fournie.

4. Les modifications ont entraîné l'annulation :

- ☐ de la description,              pages :
- ☐ des revendications,              n°s :
- ☐ des dessins,                      feuilles :

**RAPPORT D'EXAMEN  
PRÉLIMINAIRE INTERNATIONAL**

Demande internationale n° PCT/FR99/02947

5. ☐ Le présent rapport a été formulé abstraction faite (de certaines) des modifications, qui ont été considérées comme allant au-delà de l'exposé de l'invention tel qu'il a été déposé, comme il est indiqué ci-après (règle 70.2(c)) :

*(Toute feuille de remplacement comportant des modifications de cette nature doit être indiquée au point 1 et annexée au présent rapport)*

6. Observations complémentaires, le cas échéant :

**V. Déclaration motivée selon l'article 35(2) quant à la nouveauté, l'activité inventive et la possibilité d'application industrielle; citations et explications à l'appui de cette déclaration**

1. Déclaration

Nouveauté	Oui : Revendications 1-19
	Non : Revendications
Activité inventive	Oui : Revendications 1-19
	Non : Revendications
Possibilité d'application industrielle	Oui : Revendications 1-19
	Non : Revendications

2. Citations et explications  
**voir feuille séparée**

L'art antérieur le plus proche, le document WALENSKI, W.: "Watermarks and Those That Are Not", Druckspiegel 52, no 3: 66-68 (March 1997), décrit un procédé pour réaliser un pseudofiligrane sur un papier non-couché, comprenant l'application sous chaleur et pression d'une pièce de marquage, représentant le motif du pseudofiligrane, sur une feuille de papier remouillée. Le procédé selon la revendication 1 comporte comme caractéristiques nouvelles que la feuille est remouillée à des endroits prédéterminés et que toute la surface de la feuille est exposée à la chaleur et la pression pour faire évaporer la solution de remouillage. Les nouvelles caractéristiques permettent de réaliser avec souplesse des pseudofiligranes en petites quantités. Le document WO-A-9717493 enseigne de produire des pseudofiligranes sur des papiers couchés en faisant varier le poids de la couche. Les documents US-A-4824486 et DE-U-29714004 décrivent de produire des pseudofiligranes par imprimage avec une encre spécifique. La revendication 1 est donc à considérer comme alternative non-évidente et remplit les conditions de l'Article 33(2) et 33(3) PCT. La même argumentation est valable pour la revendication indépendante 11, qui définit un papier résultant du procédé selon la revendication 1, qui a comme caractéristique nouvelle que la masse surfacique dans les zones ayant une réduction d'épaisseur est identique à celle du reste du papier. La possibilité d'application industrielle est évidente.

**REVENDICATIONS**

1. Procédé de fabrication d'un papier non couché, comportant au moins une marque ressemblant à un filigrane caractérisé en ce qu'on réalise ladite marque après l'étape de séchage du papier, en effectuant les étapes dans lesquelles :
- 5 a) on applique une solution de remouillage sur au moins une face du papier non couché, dans une ou des zones déterminées, puis
- b) on applique une pression et une chaleur dans la ou lesdites zones du papier remouillé de manière à évaporer ladite solution et densifier le papier non couché dans la ou lesdites zones par rapport au reste du papier, en appliquant lesdites pression et chaleur sur toute la surface de la feuille.
- 10 2. Procédé selon la revendication 1, caractérisé en ce qu'à l'étape a) ladite solution de remouillage est appliquée à l'aide d'un dispositif d'impression par jet d'encre sur papier, notamment un dispositif d'impression numérique par jet d'encre, dans lequel on remplace l'encre par ladite solution de remouillage.
- 15 3. Procédé selon la revendication 1 à 2, caractérisé en ce que à l'étape b) on applique ladite pression et ladite chaleur en effectuant un calandrage du papier non couché.
- 20 4. Procédé selon l'une des revendications 1 à 3, caractérisé en ce que ladite solution de remouillage est une solution aqueuse.
5. Procédé selon l'une des revendications 1 à 4, caractérisé en ce que ladite solution de remouillage comporte des additifs choisis parmi des agents mouillants, des agents colorants notamment des agents de nuancage, des agents fluorescents blanchissants, des agents inhibiteurs de fluorescence, des agents antifalsification ou d'authentification.
- 25 6. Procédé selon la revendication 4, caractérisé en ce que ladite solution aqueuse est une solution hydroalcoolique.
- 30 7. Procédé selon l'une des revendications 4 à 6, caractérisé en ce que ladite solution aqueuse contient de 1 à 10% en volume d'éthanol dans de l'eau.

14

8. Procédé selon la revendication 4 ou 5, caractérisé en ce que ladite solution aqueuse contient de 1 à 10 % en poids de 2-pyrrolidone dans de l'eau.

9. Procédé selon l'une des revendications 1 à 8, caractérisé en ce que la ou lesdites zones définissent un motif visuel en observation en lumière transmise résultant d'une réduction d'opacité dans la ou lesdites zones.

10. Procédé selon l'une des revendications 1 à 9, caractérisé en ce que la ou lesdites zones définissent un motif visuel en observation en lumière réfléchie résultant d'une différence de couleur dans la ou lesdites zones.

11. Papier non couché comportant au moins une marque ressemblant à un filigrane, et correspondant à une ou des zones déterminées du papier non couché présentant une réduction d'épaisseur par rapport au reste du papier non couché, la masse surfacique dans la ou lesdites zones du papier étant identique à celle du reste du papier, caractérisé en ce qu'il est obtenu par le procédé selon l'une des revendications 1 à 10.

12. Papier non couché selon la revendication 11, caractérisé en ce que la ou lesdites zones présentent une réduction d'opacité par rapport au reste du papier.

13. Papier non couché selon l'une des revendications 11 ou 12, caractérisé en ce que la ou lesdites zones présentent une couleur, et notamment une nuance et/ou une luminosité, différente de celle du reste du papier.

14. Papier non couché selon l'une des revendications 11 à 13, caractérisé en ce que la ou lesdites zones comportent des agents choisis parmi des agents colorants, des agents fluorescents, des agents inhibiteurs de fluorescence, des agents antifalsification ou d'authentification.

15. Papier non couché selon l'une des revendications 11 à 14, caractérisé en ce qu'il comporte deux ou plusieurs jets fibreux.

16. Papier non couché selon la revendication précédente, caractérisé en ce que seul l'un des jets de surface présente une réduction d'épaisseur et/ou une différence de nuance et/ou de luminosité dans la ou lesdites zones par rapport au reste du papier multijet.

17. Papier non couché selon l'une des revendications 11 à 16, caractérisé en ce qu'il comporte deux ou plusieurs feuilles de papier contrecollées.

5 18 Papier non couché selon la revendication précédente, caractérisé en ce que la colle de contrecollage est colorée.

19. Papier selon les revendications 17 ou 18 caractérisé en ce que seule l'une des feuilles du papier contrecollé présente une réduction d'épaisseur et/ou une différence de nuance et/ou une  
10 différence de luminosité dans la ou lesdites zones par rapport au reste du papier contrecollé.

091857143

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Translation

Applicant's or agent's file reference PCT142	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/FR99/02947	International filing date (day/month/year) 29 November 1999 (29.11.99)	Priority date (day/month/year) 01 December 1998 (01.12.98)
International Patent Classification (IPC) or national classification and IPC D21H 25/08		
Applicant ARJO WIGGINS S.A.		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of <u>4</u> sheets, including this cover sheet.
<input checked="" type="checkbox"/>	This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
	These annexes consist of a total of <u>3</u> sheets.
3.	This report contains indications relating to the following items:
I	<input checked="" type="checkbox"/> Basis of the report
II	<input type="checkbox"/> Priority
III	<input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	<input type="checkbox"/> Lack of unity of invention
V	<input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	<input type="checkbox"/> Certain documents cited
VII	<input type="checkbox"/> Certain defects in the international application
VIII	<input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 27 June 2000 (27.06.00)	Date of completion of this report 28 November 2000 (28.11.2000)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.



## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/FR99/02947

## I. Basis of the report

1. With regard to the **elements** of the international application:\*

- ☐ the international application as originally filed
- ☒ the description:  
pages 1-12, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☒ the claims:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, as amended (together with any statement under Article 19  
pages \_\_\_\_\_, filed with the demand  
pages 1-19, filed with the letter of 15 November 2000 (15.11.2000)
- ☐ the drawings:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_
- ☐ the sequence listing part of the description:  
pages \_\_\_\_\_, as originally filed  
pages \_\_\_\_\_, filed with the demand  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/fig \_\_\_\_\_

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).\*\*

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/FR 99/02947

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Claims	1-19	YES
	Claims		NO
Inventive step (IS)	Claims	1-19	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-19	YES
	Claims		NO

### 2. Citations and explanations

The closest prior art document, namely WALENSKI, W.: "Watermarks and Those That Are Not", Druckspiegel 52, no. 3: 66-68 (March 1997), describes a method for making a pseudo-watermark on uncoated paper by applying a marking element representing the pseudo-watermark pattern onto a rewet paper sheet under high-temperature and high-pressure conditions. The method according to claim 1 comprises, as the novel features, the fact that the sheet is rewet in predetermined areas and the entire surface of the sheet is exposed to heat and pressure to evaporate off the rewetting solution. The novel features enable small numbers of pseudo-watermarks to be produced in a flexible manner. Document WO-A-97/17493 teaches the production of pseudo-watermarks on coated paper by varying the weight of the coating layer. Documents US-A-4824486 and DE-U-29714004 describe the production of pseudo-watermarks by printing with a specific ink. Therefore, claim 1 should be considered to be a non-obvious alternative and complies with the requirements of PCT Article 33(2) and (3). The same applies to independent claim 11, which defines paper achieved by means of the method according to claim 1, wherein the novel feature is that the mass per unit area in the areas with a reduced thickness is the same as that in the rest of the paper. Industrial applicability is

**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

International application No.

PCT/FR 99/02947

obvious.

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## CLAIMS

1. Uncoated paper comprising at least one mark resembling a watermark, characterized in that a specific area or specific areas of the uncoated paper present a reduced thickness with respect to the rest of the uncoated paper, the weight per surface unit in the said area(s) of the paper being identical to that of the rest of the paper.
2. Uncoated paper according to claim 1, characterized in that the said area(s) present a reduction in opacity with respect to the rest of the paper.
3. Uncoated paper according to any one of claims 1 to 2, characterized in that said area(s) present a color, in particular a tint and/or a luminosity, which is different from that of the rest of the paper.
4. Uncoated paper according to any one of claims 1 to 3, characterized in that it presents a reduction in thickness and in opacity with respect to the rest of the paper in that said area(s).
5. Uncoated paper according to any one of claims 1 to 4, characterized in that said area(s) comprise agents chosen from amongst colorants, fluorescent agents, fluorescence-inhibiting agents, anti-counterfeiting agents, and authentication agents.
6. Uncoated paper according to any one of claims 1 to 5, characterized in that this comprises two or more fibrous webs.
7. Uncoated paper according to the preceding claim, characterized in that only one of the surface webs has a reduced thickness and/or a difference in tint and/or a difference in luminosity in said area(s), with respect to the rest of the multi-web paper.
8. Uncoated paper according to any one of claims 1 to 7, characterized in that this comprises two or more laminated sheets of paper.
9. Uncoated paper according to the preceding claim, characterized in that the laminating adhesive is colored.
10. Uncoated paper according to claim 8 or claim 9, characterized in that only one of the laminated sheets of paper has a reduced thickness and/or difference in tint and/or a difference in luminosity in said area(s), with respect to the rest of the laminated paper.
11. A method of manufacturing an uncoated paper, comprising at least one mark resembling a watermark, characterized in that said mark is produced after the paper drying step, by performing steps wherein:
  - a) a rewetting solution is applied to at least one side of an uncoated paper in specific area(s), then
  - b) pressure and heat are applied to said area(s), of re-wetted uncoated paper so as to evaporate said solution and increase the density of the uncoated paper in said area(s), with respect to the rest of the paper.
12. A method according to claim 11, characterized that in the step a), said rewetting solution is applied to the paper by means of an inkjet printing device, and particularly a digital inkjet printing device, wherein the ink is replaced by said rewetting solution.

13. A method according to any one of claims 11 to 12, characterized that in the step b) said pressure and said heat are applied by calendering the uncoated paper.

14. A method according to any one of claims 11 to 13, characterized in that said rewetting solution is an aqueous solution.

15. A method according to any one of claims 11 to 14, characterized in that said rewetting solution comprises additives chosen from amongst wetting agents, colorants, and particularly tinting agents, fluorescent whiteners, fluorescence-inhibiting agents, anti-counterfeiting agents, and authentication agents.

16. A method according to claim 14, characterized in that said aqueous solution is a hydroalcoholic solution.

17. A method according to claim 16, characterized in that said aqueous solution contains 1 to 10% by volume of ethanol in the water.

18. A method according to claim 14 or claim 15, characterized in that said aqueous solution contains 1 to 10% by weight of 2-pyrrolidone in the water.

19. A method according to any one of claims 11 to 18, characterized in that said area(s) define a visual pattern when observed in transmitted light, as a result of reduction of the opacity of said area(s).

20. A method according to any one of claims 11 to 19, characterized in that said area(s) define a visual pattern when observed in reflected light, as a result of the difference in color in said area(s).



## DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITE DE COOPERATION EN MATIÈRE DE BREVETS (PCT)

(51) Classification internationale des brevets <sup>7</sup> : D21H 25/08, 27/02, 21/40	A1	(11) Numéro de publication internationale: WO 00/32874 (43) Date de publication internationale: 8 juin 2000 (08.06.00)
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(21) Numéro de la demande internationale: PCT/FR99/02947

(22) Date de dépôt international: 29 novembre 1999 (29.11.99)

(30) Données relatives à la priorité:  
98/15183 1er décembre 1998 (01.12.98) FR

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(81) Etats désignés: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, brevet ARIPO (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), brevet eurasien (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), brevet européen (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), brevet OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Publiée

Avec rapport de recherche internationale.

(54) Titre: UNCOATED PAPER COMPRISING A PSEUDO-WATERMARK AND METHOD FOR MAKING SAME

(54) Titre: PAPIER NON COUCHE COMPORTANT UN PSEUDO-FILIGRANE ET PROCEDE DE FABRICATION

(57) Abstract

The invention concerns an uncoated paper comprising at least a mark resembling a watermark, characterised in that one or several specific zones of the paper has a reduced thickness with respect to the rest of the paper, the mass per unit area in said zone(s) of the paper being identical to that of the rest of the paper. The invention also concerns a method for making uncoated paper comprising at least a mark resembling a watermark characterised in that it consists of producing said mark after the paper-drying step, by the following steps which consist in: a) applying a wetting solution on at least one face of the uncoated paper; then b) applying pressure and heat in said zone(s) so as to evaporate said solution and densify the non-coated paper in said zone(s) with respect to the rest of the paper.

(57) Abrégé

La présente invention a pour objet un papier non couché comportant au moins une marque ressemblant à un filigrane, caractérisé en ce qu'une ou des zones déterminées du papier présentent une réduction d'épaisseur par rapport au reste du papier, la masse surfacique dans la ou lesdites zones du papier étant identique à celle du reste du papier. La présente invention concerne aussi un procédé de fabrication d'un papier non couché comportant au moins une marque ressemblant à un filigrane caractérisé en ce qu'on réalise ladite marque après l'étape de séchage du papier, en effectuant les étapes dans lesquelles: (a) on applique une solution de remouillage sur au moins une face du papier non couché, dans une ou des zones déterminées, puis (b) on applique une pression et une chaleur dans la ou lesdites zones du papier non couché remouillé de manière à évaporer ladite solution et densifier le papier non couché dans la ou lesdites zones par rapport au reste du papier.

09/508,625  
4-24-2000  
Michel Bognelin et al.  
Att. d'ictat\*  
105348

COATED PAPER INCLUDING A PSEUDO-WATERMARK, AND A METHOD  
OF MANUFACTURE

5 The present invention relates to coated paper having  
at least one pseudo-watermark constituted by a mark that  
gives said paper a visual effect and a texture that  
resemble those of a watermark.

The present invention also relates to a method of  
manufacturing coated paper of the invention.

10 In general, watermarked paper is used in the field  
of anti-falsification paper, e.g. for paper money and  
checks, and for official documents such as passports,  
stamped papers, notarized deeds, since the presence of  
the watermark makes infringement and reproduction by  
photocopying more difficult, and provides means for  
15 recognizing and/or authenticating said paper.  
Watermarked paper is also used in the field of  
personalized business paper with the logo, name, or  
trademark of the business being reproduced in the form of  
a watermark.

20 For paper that is intended mainly for printing  
and/or writing, in particular for personalized business  
paper, coated paper is preferred since print quality is  
better. However, in these two fields of watermark  
applications, the tonnage of paper involved is variable  
25 and small compared with the production capacity of a  
modern coating machine.

Various ways are known for making watermarked paper,  
depending on whether the watermark is a "real" or a  
"pseudo" watermark.

30 At present, various methods have been proposed for  
making watermarked coated paper and they can be  
classified in three categories.

35 1) "Real" watermarks are obtained during fabrication  
of the sheet of paper in the wet portion of the paper-  
making machine, by means of round shapes that include  
imprints or embossing in recessed and/or relief form, or  
by using watermarking rolls having embossing in relief

and/or recessed form associated with a flat plate (Fourdrinier machine). A pattern is then obtained that comprises zones that are pale when the sheet of paper is observed in transmitted light, if the imprints are in relief, or zones that are dark or shaded, if the imprints are formed by recesses. The pale zones are due to the fact that the thickness of the sheet and the quantity of fibers (density per unit area) are smaller in the zones corresponding to the imprints than in the remainder of the sheet of paper. Conversely, the dark zones are due to the fact that the thickness of the sheet and the quantity of fibers are greater in the zones corresponding to the imprints.

To make paper that is both watermarked and coated, those wet methods of watermarking are unsuitable for various reasons. Firstly, when the watermark is made in the supporting paper or medium, the difference in thickness and the difference in opaqueness of the sheet in the watermarked zone made on the medium are degraded or even lost when depositing the coating which makes the surface of the medium uniform and opaque. In addition, wet methods of watermarking require the use of expensive implementation means, such as watermarking rolls, that are specific to each type of watermark. Furthermore, since modern coating machines have very great production capacity, they do not provide the flexibility required for manufacturing watermarked coated paper in the small quantities desired by the market.

2) "Pseudo-watermarks" can be made by means of a compound which is caused to penetrate in or to be printed on determined zones of the paper and which acts by making the mat of fibers constituting the sheet of paper more transparent on a permanent basis, or by glazing the surface. Those methods significantly alter the surface properties of paper treated in that way, and in particular the quality of the coating when said paper



supports coating, and suitability for printing when said paper is watermarked coated paper.

3) WO 97/17493 describes coated paper with pseudo-watermarks that result from varying the weight of coating applied in determined zones, thereby giving rise to variation in thickness and opaqueness in said zones where the weight of the coating has been reduced or increased. That method requires coating to be made by means of apparatus including a roll, in particular a backing roll, having imprints formed thereon in relief or as recesses for the purpose of causing the quantity of coating to be greater or smaller in the zone of the imprint.

Independently of any difficulties that may be associated with performance thereof, that method requires the conventional coating method to be modified by using special rolls that are specific to each watermark. That method therefore does not provide the flexibility needed to enable small quantities of paper to be manufactured "to order" under conditions that are economically satisfactory when using modern industrial coating machines that have large production capacity.

An object of the present invention is to provide coated paper including pseudo-watermarks constituting marks which modify physical characteristics of the paper in localized manner, e.g. its density, and starting from certain properties such as its thickness and possibly its opaqueness.

Another object of the present invention is to provide coated paper having pseudo-watermarks constituting marks which create gloss and/or shade contrast with the remainder of the sheet of coated paper.

Another object of the present invention is to provide a coated paper having pseudo-watermarks made without requiring ink or glazing to be applied to its surface so that the composition of the paper in the zones constituting the pseudo-watermark is not significantly altered.

Another object of the present invention is to provide coated paper with pseudo-watermarks whose properties in use, in particular properties concerning printability in those zones of the surface of the paper which correspond to said marks, are not significantly spoiled relative to unwatermarked coated paper.

Another object of the present invention is to provide coated paper having pseudo-watermarks that can be manufactured in variable and small quantities under conditions that are more economical than is possible using the methods of the prior art, and that can be obtained in machine widths and quantities that are independent of the characteristics of the coating machine, in particular by means of a method enabling modern coating machines to be used that have large production capacity, and without requiring any modification to be made to the operation of the coating machine proper.

Another object of the present invention is to provide a coated paper having a pseudo-watermark in which said watermark is made after the last coating operation, i.e. at the outlet from the coating machine, and possibly on coated paper that has been finished, i.e. remote from the coating production line.

To do this, the present invention provides a method of manufacturing a coated paper having at least one mark resembling a watermark, the method being characterized in that said mark is made after the drying step which follows the last coating operation, and by performing steps in which:

- a) a re-wetting solution is applied to at least one face of the coated paper, in one or more determined zones; and
- b) pressure and heat are applied in said re-wetted zone(s) of the coated paper so as to evaporate said solution and densify the coated paper in said zone(s) relative to the remainder of the coated paper.

In the present invention, the term "re-wetted coated paper" is used to mean that, in said zone(s), the re-wetting solution has penetrated into the coating and possibly also into the supporting medium, and has not yet evaporated.

In the present invention, said re-wetting solution is evaporated by exerting pressure over the entire sheet of coated paper or only in said zones, and by increasing the temperature of the coated paper, and the coated paper is densified in the zones where said solution was initially applied. This increases the density of the coated paper in said zones relative to the remainder of the sheet of paper, and more precisely this reduces the thickness of the paper while maintaining density per unit area that is identical to the remainder of the paper. Said zones can then present contrast in terms of opaqueness (reduction of opaqueness) and/or contrast in terms of gloss (increase of gloss), and/or contrast in terms of color, and in particular color shade (color difference) relative to the remainder of the sheet of paper.

The opaqueness of the paper is associated in part with the presence of air in the gaps between the fibers of the medium or between the grains of pigment in the coating. During the re-wetting step, the solution replaces the air in said gaps. Then during step b), the solution is evaporated and the fibers and/or the pigment layer are densified, such that the air gaps then occupy smaller overall volume, and in particular the total quantity thereof is smaller than the initial quantity, thereby giving rise to deopacification.

It should be observed, that in original manner, in the method of the invention, densification of the coating and possibly also of the medium comes from a reduction in the thickness of the treated zones relative to the remainder of the coated paper, with the density per unit area and specifically the weight of the layer remaining

constant relative to the remainder of the paper. In contrast, in a "real" watermark, the density per unit area is reduced in the pale zones because the quantity of fibers deposited is smaller than in the remainder of the sheet. In the pseudo-watermark described in WO 97/17493, the density per unit area is not constant since the weight of the coating is reduced in certain zones.

The opaqueness contrast can be the result of deopacification of the coating on its own, if the re-wetting solution does not penetrate into the medium, and also from deopacification of the fiber medium if the quantity and the nature of the re-wetting solution and/or the composition of the surface coating enable said solution to penetrate into the medium.

Re-wetting of the surface layer facilitates rearrangement of the pigments during calendering, which can give rise to an increase in gloss depending on the quantity and the nature of the re-wetting solution and depending on the characteristics of the coating. In particular, depending on the size and the shape of the grains of pigment, these are rearranged to a greater or lesser extent during calendering in step b), and the gloss contrast is visible to a greater or lesser extent. Additives can be included in the re-wetting solution and/or in the composition of the coating to facilitate rearrangement of the grains of pigment and/or to facilitate greater or lesser penetration of said solution into the paper.

In practice, to ensure that opaqueness contrast is clearly visible by viewing with transmitted light, it is preferable during the re-wetting operation for the re-wetting solution to penetrate down to the fiber medium.

When the fiber medium is not re-wetted or is re-wetted to a small extent only, and when opaqueness contrast is associated only with a reduction in the opaqueness of the coating, there does indeed exist theoretical reduction in the opaqueness of the coated

paper in said zones, but in practice it is difficult for the untrained eye to observe.

Similarly, when the determined re-wetting zones define narrow areas such as the fine lines defining characters or letters, the glossiness contrast when  
5 observing with reflected light is difficult for the untrained eye to see.

Similarly, when the surface coating is a matte coating having pigment grains of size and shape such that they cannot be rearranged even by calendering, no gloss  
10 contrast can be observed in said zones.

The method of the present invention can also modify the color of the coated paper in said zone(s) when said re-wetting solution includes a coloring agent, and in particular a shading coloring agent. Color contrast in  
15 said zone(s) can also result from a modification in the opaqueness of the surface layer when there initially exists a difference in shade between the medium and the surface coating and/or between a first surface coating  
20 and a second surface coating, since the shade of the finished coated paper is, in fact, the result of the shades of the medium and of the various coatings applied on the medium. When the medium and the coating have the same shade, shade contrast in said zone(s) can result  
25 only from adding a shading coloring additive in the wetting solution. In an advantageous embodiment, the medium is not as bright as the coating.

The method of the present invention applies to all white or colored papers without restriction on weight,  
30 and optionally pasted.

Coating compositions for printing and/or writing are well known to the person skilled in the art. The purpose of the coating is to transform the surface of the paper into a uniform microporous surface mainly for the purpose  
35 of achieving better printability, and possibly also of improving the whiteness of the paper or the card, its matte, mill-finished, or glossy appearance, or indeed its

feel. In addition to printability, the fineness and the shape of the grains of pigment in the coating determine the opaqueness of the coated paper and also its gloss.

In the present invention, the term "coated paper" is used to designate paper that is coated in a pigmented layer having at least fine natural or synthetic inorganic pigments, in particular kaolin and/or calcium carbonate, and at least one binder or adhesive, in particular starch or latex, and also, possibly, any additive commonly employed by the person skilled in the art for the purpose of improving the rheological properties of the coating mixture and of conferring special properties of the coating. The weight of the coating can lie in the range 2 g/m<sup>2</sup> to 50 g/m<sup>2</sup> on one or both faces, i.e. including paper that is commonly called "surface-treated paper" with coating weights of 2 g/m<sup>2</sup> to 10 g/m<sup>2</sup>. Particular mention is given to coated paper having coating on one or both faces weighing 10 g/m<sup>2</sup> to 50 g/m<sup>2</sup>.

In an implementation, the pigmented layer has 70% to 95% pigment and 5% to 30% binder, ignoring additives.

In the present description, the term "coating operation" is used to designate the operation which consists in depositing a coating composition or a coating mixture comprising fine pigments, a binder or adhesive, water, and additives on one or both faces of a sheet of paper or card which is referred to as the "medium".

The coating of the invention can be applied by any means known to the person skilled in the art on at least one of the two faces, in at least one pass, and in particular using conventional coating installations such as a size press or a metering size press, a metal blade coating machine, an air knife coating machine, or a "champion" type rotary bar coating machine.

The step of drying the coated paper consists in eliminating the water contained in the coating and also the water that has penetrated into the medium. To dry the paper which has just received the coating, it is

possible, in particular, to use infrared dryers, conventional drying cylinders optionally surmounted by a high speed hot air blowing hood, or hot air tunnels.

In a preferred implementation, in step b), said  
5 pressure and said heat are applied while calendering the coated paper.

The rolls of the calender can be heated, but in any event the friction produced by the calender generates heat.

10 In the present invention, the calendering operation is performed using calenders known to the person skilled in the art. Calenders are a kind of rolling mill with superposed rolls for the purpose of flattening the  
15 surfaces by compressing them in order to make them suitable for writing and printing, and also to give them a feel that is somewhat soft, and somewhat "smooth". On passing between the rolls, the peaks of portions in relief are flattened by the pressure, and the sheet is made denser. Another purpose of calendering can also be  
20 to make the surfaces glossy. In addition to the pressure effect, slip is encouraged between the sheet and the rolls so as to fill in recesses in part and so as to orient the fibers and the fillers situated at the surface so that they lie in the plane thereof.

25 The calender is generally constituted by quenched cast iron rolls alternating with resilient rolls. Microsliding takes place between the various rolls with the effect of giving a milled and glossy appearance thereto. The calender is often situated outside the  
30 machine for reasons associated with maintenance, roll changing, and sheet breaks. The linear pressure exerted on the paper between the rolls is of the order of 0.5 kN/cm to 500 kN/cm. When heated, the temperature of the rolls can lie in the range 50°C to 300°C.

35 In the present invention, and for given equipment, the various calendering parameters such as temperature, press hardness, and pressure are selected as a function

of the desired final contrast. These various parameters are adapted as a function of calendering speed, itself controlled by the rate at which the re-wetting solution is applied. The calendering operation does not give rise to additional costs insofar as all high-quality coated papers, even when matte, are, in practice, calendered.

In the present invention, the mark can correspond to said zone(s) and can constitute a given pattern that appears positive in contrast relative to the remainder of the non-re-wetted sheet of paper. Conversely, the given pattern can appear negative in contrast insofar as the mark corresponds to the non-treated remainder of the sheet of paper, i.e. that part which was not initially re-wetted. In particular, said zone(s) can define a visible pattern when observed in transmitted light that results from a reduction of opaqueness in said zone(s). Said zone(s) can also define a visible pattern when observed in reflected light that results from an increase in gloss and/or a color difference of said zone(s).

Said mark preferably corresponds to said treated zone(s).

Preferably, in order to satisfy the volume objectives for made-to-measure markets, step a) is performed on coated paper remote from the coating line, i.e. it is performed on finished coating paper.

In step a) the re-wetting solution of the invention can be applied by means of a heliograph having a photoetching cylinder whose imprints or recesses are shaped so as to enable said re-wetting solution to be applied in a pattern corresponding to said mark in said zone(s).

The re-wetting solution is preferably applied by means of a device of the type used in ink jet printing methods, and in particular methods of ink jet printing on reels, it being understood that said ink is replaced by said re-wetting aqueous solution. Ink jet printing devices, and in particular digital ink jet printer



devices enable marks to be made in various patterns that can be modified quickly and at low cost from one run to another.

Said re-wetting solution advantageously includes a wetting agent so as to improve or accelerate penetration of the solution into the coating and possibly also into the medium. Said wetting agent can be advantageous, in particular depending on the characteristics of the coating, specifically its porosity and the optional presence therein of a wetting agent, and also depending on the characteristics of the medium, and finally on the quantity of re-wetting solution that is applied. As an illustration, it is possible to apply re-wetting solution at a rate of 2 g/m<sup>2</sup> to 20 g/m<sup>2</sup>.

Advantageously, said re-wetting solution is a solution of a hydrophilic polar solvent.

As a wetting agent, it is possible in particular to use ethanol or 2-pyrrolidone.

The re-wetting solution is preferably an aqueous solution, since the use of a non-aqueous solvent would give rise to greater costs and run the risk of pollution.

In a suitable embodiment, in particular for re-wetting commercially available coated papers for printing and/or writing, it is possible for the re-wetting solution to be an alcohol-and-water solution.

More particularly, it is possible to use an aqueous solution containing 1% to 10% by volume of ethanol, and in particular 2%, in water, or an aqueous solution containing 1% to 10% by weight of 2-pyrrolidone, in particular 2% in water.

In some cases, it can be possible to use water without a wetting agent as the re-wetting aqueous solution, particularly when the coated paper is very porous and/or includes wetting agents in its own composition, as in the case for certain silica-based coatings used for paper that is specifically designed for ink jet printing.

The re-wetting solution may optionally also include additives such as dyes, in particular shading coloring agents, fluorescent whitening agents (optical bleaches) or conversely agents that inhibit fluorescence and any additive known to the person skilled in the art for enabling anti-falsification paper to be recognized or authenticated. In particular, the re-wetting solution can include an anti-falsification agent or an authentication agent that is colorless and suitable for being revealed by reacting with a determined co-reagent or under special conditions.

The present invention also provides coated paper including at least one mark resembling a watermark and characterized in that one or more determined zones of the coated paper present thickness that is smaller than the thickness of the remainder of the sheet of coated paper, with the density per unit area in said zone(s) of coated paper being identical to that of the remainder of the paper. In particular, the weight of the coating is identical in said zone(s) and in the remainder of the paper, it being understood that the amount of variation in the weight that could result from the presence of a non-evaporated additive from the re-wetting solution is not significant.

In an embodiment, said zone(s) present(s) reduced opaqueness relative to the remainder of the coated paper.

In another variant embodiment, said zone(s) can present greater gloss than the remainder of the coated paper.

In another variant embodiment, said zone(s) can present a color, and in particular a shade, that differs from that of the remainder of the coated paper.

In paper of the present invention, the medium and the layer(s) of coating thereon can present reduced thickness and opaqueness in said zone(s) relative to the remainder of the coated paper.

In a variant, only the surface coating(s) on the medium need present a reduction in thickness and an increase in gloss in said zone(s) relative to the remainder of the coated paper, the thickness of the medium remaining unchanged.

Finally, in the present invention, the coating can present on its surface in said zone(s) agents selected from coloring agents, fluorescent agents, fluorescence-inhibiting agents, and agents for recognition or authentication purposes. These agents can be deposited by applying the re-wetting solution and can remain after it has evaporated. Anti-falsification or authentication agents are well known to the person skilled in the art in the field of anti-falsification paper.

Other characteristics and advantages of the present invention appear in the light of the following detailed description of various embodiments.

Figure 1 shows the pseudo-watermark of Example 1. Figure 2 shows the logo of the Applicant in application of Example 2. Figure 3 shows the pattern constituted by the name of the Applicant in application of Example 3. Figures 4a and 4b show the pseudo-watermark of Figure 7. In all of the figures, the dark zones (1) represent zones that were initially re-wetted. On the real paper, when observed by transmitted light, they actually appear paler when contrast is by opaqueness, or glossier and/or darker when contrast is by gloss and/or shade. The zones (2) are non-treated zones.

#### 30 CONDITIONS A

To simulate digital print systems by means of an ink jet on a reel, a Hewlett Packard Deskjet 500 C office printer was used fitted with a cartridge referenced 51626A that had previously been emptied of its ink, cleaned, and then filled with a re-wetting solution constituted by distilled water together with 2% by volume ethanol, so as to re-wet the following papers with

various patterns. In these examples, the marks are positive and the quantity of re-wetting solution supplied for a sheet wetted at a resolution of 300 dots per inch, and the pitch conditions were "coarse grain", at "letter" quality, with "normal" intensity setting, of about 12 g/m<sup>2</sup>.

Immediately after being re-wetted, the paper was passed through a laboratory calender having two rolls heated to 50°C, and applying linear pressure of 1.9 kN/cm.

#### EXAMPLE 1: OPAQUENESS CONTRAST

A sample of 135 g/m<sup>2</sup> of white paper taken raw from a non-calendered coating machine and corresponding after finishing to three-layer two-face coated paper with a total coating weight of 45 g/m<sup>2</sup>, sold under the trademark Maine®, gave rise after being re-wetted with the pattern of Figure 1 which constitutes the image of a gate and the word "GRAPHIC", using software implementing Times New Roman 72 font, followed by calendering, to a coated paper having marks resembling a translucent shaded watermark of the image of the gate and the pattern "GRAPHIC". Given the fineness of the lines constituting the letter characters, the gloss effect was difficult to observe. The variable reduction in thickness in the treated zone went up to as much as 40% compared with the remainder of the paper.

#### EXAMPLE 2: GLOSS AND COLOR CONTRAST

A sample of 250 g/m<sup>2</sup> ivory color paper, taken raw from the non-calendering coating machine, and corresponding after finishing to three-layer, two-face coated paper with a total coating weight of 68 g/m<sup>2</sup>, sold under the trademark Ideal®, gave rise, after re-wetting with the image of the Applicant's logo, followed by calendering, to coated paper presenting the Applicant's logo as shown in Figure 2 as a "watermark" by contrast

with a gloss difference of +6 points (TAPPI 75°) and with a color difference  $\Delta E$  of 1.19 (CIELAB 1976). Given the considerable thickness and weight of the medium and the quantity of re-wetting solution applied, the solution did not penetrate in satisfactory manner into the fiber medium so that the loss of opaqueness was very small and no significant opaqueness contrast was observed. The thickness reduction in the treated zones was about 6% relative to the remainder of the paper.

#### EXAMPLE 3: OPAQUENESS CONTRAST

Under the same conditions as in Example 1, 90 g/m<sup>2</sup> surface-treated paper was used that had been watermarked in conventional manner in the wet portion of the paper-making machine, corresponding to the watermarked laid paper sold under the trademark Conqueror®. After the paper had been re-wetted with a pattern constituting by the words "ARJO WIGGINS", and then calendered, paper was obtained having opaqueness contrast, when observed in transmitted light, with the "ARJO WIGGINS" watermark of the invention and the original clear watermarks being juxtaposed without any difference in quality. Gloss contrast was difficult to observe on this Conqueror® surface-treated paper which has a coating with little pigment.

#### EXAMPLE 4: OPAQUENESS AND FLUORESCENT CONTRAST

A sample of 135 g/m<sup>2</sup> Maine® type white paper of Example 1 as manufactured using a laboratory coating machine with a coating composition that had no whitening fluorescent agent, was processed using the same conditions as in Example 1 with a re-wetting solution constituted by distilled water, 2% by volume ethanol, and 2% by volume of a whitening fluorescent agent sold under the trademark Blancophor® BSU PN. After calendering, the coated paper presented a pattern constituted by the words "ARJO WIGGINS" that was visible in transmitted light by

opaqueness contrast and that was revealed to a greater or lesser extent in direct viewing by shading and fluorescent contrast depending on the ultraviolet radiation content of the natural or artificial incident light used for observation.

#### CONDITIONS B

An Epson Stylus Color 1520 printer was used provided with a cartridge having the reference S 020 108, that had previously been emptied of its ink, cleaned, and then filled with a re-wetting solution, so as to make a positive print of the pattern shown in Figure 3 with a resolution of 720 dots per inch on two-face coated paper having a total coating weight of 38 g/m<sup>2</sup> and sold under the trademark Chromomat® 115 g/m<sup>2</sup>.

#### EXAMPLE 5

The re-wetting solution was constituted by distilled water and 2% by weight of 2-pyrrolidone (98% pure). After calendering at 50°C, with a linear pressure of 1.0 kN/cm, a matte coating was obtained with a pseudo-watermark of the invention, contrasted in shade and in opaqueness.

#### EXAMPLE 6

The re-wetting solution was constituted by distilled water and 2% by volume ethanol, however in this case the re-wetted coated paper was passed between the 50°C rolls of an embossing press, and embossed (cambric) coated paper was obtained with a pseudo-watermark of the invention visible by opaqueness contrast.

#### CONDITIONS C

Yet another printer was used, a Hewlett Packard Deskjet 560 C provided with a cartridge of reference 51626A previously emptied of its ink, cleaned, and then filled with a re-wetting solution constituted by

distilled water and 2% by volume ethanol, and the following example was printed as a positive at a resolution of 600x300 dots per inch. Immediately after being re-wetted, the paper was passed through a laboratory calender (different from that used in Conditions A and B) with its two rolls heated to 50°C, and applying linear pressure of 3.0 kN/cm.

#### EXAMPLE 7

10        A sample of 115 g/m<sup>2</sup> white paper coated on both faces and glossy, i.e. already calendered, with a coating having a total weight of 39 g/m<sup>2</sup>, and a medium of lower gloss than the coating, received the pattern of Figures 4a and 4b which comprises two reproductions of an identity photograph, with the dark parts of the photograph being re-wetted for Figure 4a and with the pale parts being re-wetted for Figure 4b, so that after calendering and drying, the glossy coated paper obtained in this way was an anti-falsification paper personalized by the two pseudo-watermarks of the identity photograph, which could be seen as follows:

- in Figure 4a: by direct viewing in the form of shade contrast (wetted zones having become less glossy); and
  - 25        • in Figure 4b: by observation using transmitted light in the form of opaqueness contrast (wetted zones had become less opaque and thus paler);
- it being understood that conversely Figure 4a in transmitted light and Figure 4b in direct viewing are both perceived as being printed of the negative of the identity photograph.

## CLAIMS

1/ A method of manufacturing a coated paper having at least one mark resembling a watermark, the method being characterized in that said mark is made after the drying step which follows the last coating operation, by performing steps in which:

a) a re-wetting solution is applied to at least one face of the coated paper, in one or more determined zones; and

b) pressure and heat are applied in said re-wetted zone(s) of the coated paper so as to evaporate said solution and densify the coated paper in said zone(s) relative to the remainder of the coated paper.

2/ A method according to claim 1, characterized in that in step a), said re-wetting solution is applied by means of a device for ink jet printing on paper, in particular a digital ink jet printer in which the ink is replaced by said re-wetting solution.

3/ A method according to claim 1 or 2, characterized in that in step b) said pressure and said heat are applied by calendering the coated paper.

4/ A method according to any one of claims 1 to 3, characterized in that said re-wetting solution is an aqueous solution.

5/ A method according to any one of claims 1 to 4, characterized in that said re-wetting solution includes additives selected from: wetting agents, coloring agents, in particular shading agents, whitening fluorescent agents, fluorescence-inhibiting agents, and anti-falsification or authentication agents.

6/ A method according to claim 4, characterized in that said aqueous solution is an alcohol-and-water solution.



7/ A method according to any one of claims 4 to 6, characterized in that said aqueous solution contains 1% to 10% by volume of ethanol in water.

5

8/ A method according to claim 4 or 5, characterized in that said aqueous solution contains 1% to 10% by weight of 2-pyrrolidone in water.

10 9/ A method according to any one of claims 1 to 8, characterized in that the color of the surface layer differs from that of the fiber medium and/or of a pre-layer or under-layer.

15 10/ A method according to any one of claims 1 to 9, characterized in that said zone(s) define(s) a visible pattern that can be seen in transmitted light as a result of a reduction in the opaqueness of said zone(s).

20 11/ A method according to any one of claims 1 to 10, characterized in that said zone(s) define(s) a visible pattern that can be seen in reflected light as a result of the increase in the glossiness and/or a color difference in said zone(s).

25

12/ Coated paper including at least one mark resembling a watermark obtainable by the method according to any one of claims 1 to 11.

30 13/ Coated paper including at least one mark resembling a watermark, characterized in that one or more determined zones of the coated paper present a reduction in thickness relative to the remainder of the coated paper, the density per unit area in said zone(s) of the coated  
35 paper being identical to that in the remainder of the coated paper.

## A B S T R A C T

COATED PAPER INCLUDING A PSEUDO-WATERMARK, AND A METHOD  
OF MANUFACTURE

5

The present invention relates to a method of manufacturing a coated paper having at least one mark resembling a watermark, the method being characterized in that said mark is made after the drying step which follows the last coating operation, by performing steps in which: a) a re-wetting solution is applied to at least one face of the coated paper, in one or more determined zones; and b) pressure and heat are applied in said re-wetted zone(s) of the coated paper so as to evaporate said solution and densify the coated paper in said zone(s) relative to the remainder of the paper. The present invention also provides a coated paper including at least one mark resembling a watermark, characterized in that one or more determined zones of the coated paper present a reduction in thickness relative to the remainder of the coated paper, the density per unit area in said zone(s) of the coated paper being identical to that in the remainder of the paper.

25

30

Translation of the title and the abstract as they were when originally filed by the Applicant. No account has been taken of any changes that may have been made subsequently by the PCT Authorities acting ex officio, e.g. under PCT Rules 37.2, 38.2, and/or 48.3.

35

1 2 1  
GRAPHIC

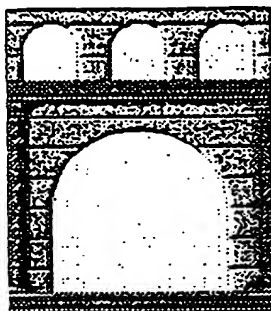


FIG. 1

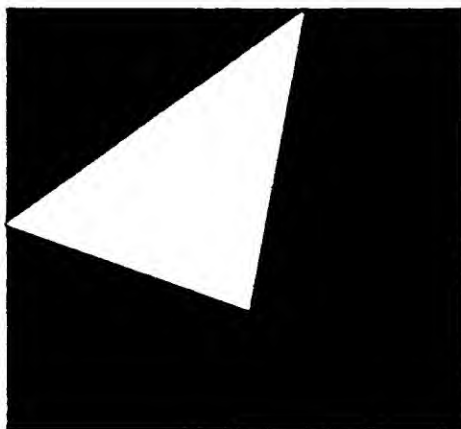


FIG. 2

# ARJO-WIGGINS R&D Bessé -sur- Braye

FIG. 3

FIG. 4 b



FIG. 4 a



# RAPPORT DE RECHERCHE INTERNATIONALE

Demande internationale No

FR 99/02947

**A. CLASSEMENT DE L'OBJET DE LA DEMANDE**  
CIB 7 D21H25/08 D21H27/02 D21H21/40

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

**B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE**

Documentation minimale consultée (système de classification suivi des symboles de classement)

CIB 7 D21H

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si réalisable, termes de recherche utilisés)

**C. DOCUMENTS CONSIDERES COMME PERTINENTS**

Catégorie *	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
X	WALENSKI, W.: "Watermarks and Those That Are Not" DRUCKSPIEGEL 52, NO. 3: 66-68 (MARCH 1997). 'GER.!', XP002109409 page 67, colonne 4 -page 68, colonne 1	1,2,4, 11,19,20
A	DE 297 14 004 U (BOCKES JOSEF ;BECKENLEHNER KARIN (DE); HELMSTREIT HERBERT (DE)) 6 novembre 1997 (1997-11-06) le document en entier	1,12,13, 15,16,19
A	US 4 824 486 A (LAFLER ROBERT E) 25 avr11 1989 (1989-04-25) le document en entier	1-5,11
A	WO 97 17493 A (MO OCH DOMSJÖE AB ;PETERSON LARS AAKE (SE)) 15 mai 1997 (1997-05-15) cité dans la demande	

☐ Voir la suite du cadre C pour la fin de la liste des documents

☒ Les documents de familles de brevets sont indiqués en annexe

\* Catégories spéciales de documents cités:

"A" document définissant l'état général de la technique, non considéré comme particulièrement pertinent

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"Z" document qui fait partie de la même famille de brevets

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Renseignements relatifs aux membres des familles de brevets

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FR 99/02947

Document brevet cité au rapport de recherche	Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
DE 29714004 U	06-11-1997	DE 19832878 A	01-07-1999
US 4824486 A	25-04-1989	US 4919044 A	24-04-1990
WO 9717493 A	15-05-1997	SE 505397 C	18-08-1997
		AU 704901 B	06-05-1999
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		CA 2236860 A	15-05-1997
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		NO 982058 A	03-07-1998
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